EXECUTIVE SUMMARY

Project Summary

In 1998 one reach of Crow Creek was listed as impaired by the Wyoming Department of Environmental Quality (DEQ) and placed on the Clean Water Act (CWA), Section 303(d) list of waters not meeting CWA goals. The listed impairments were ammonia, cadmium, and fecal coliform. The Laramie County Conservation District (LCCD) held a public meeting in February 1999 to determine if there was local support for a watershed planning effort and to solicit volunteers. Volunteers from local government, F.E. Warren Air Force Base, private industry, farming, ranching, and local citizens became the Watershed Steering Committee for the local watershed planning effort. The mission identified by the volunteer group was to 'Develop a watershed management plan for Crow Creek that considers: water quality, water quantity, property rights, sustainable and diverse wildlife communities, legal requirements, defensible data, planned development, land use planning, and functions of riparian and flood plain areas.' LCCD sponsored the planning effort and the Natural Resources Conservation Service (NRCS) and other agencies provided technical assistance.

Background

The headwaters of Crow Creek begin in the mountains of the Medicine Bow National Forest in Albany County (see Map 2.1). The upper watershed is represented by state lands, national forest lands and private lands surrounding municipal water supply reservoirs. These reservoirs and tributaries are potentially affected by forest management, livestock grazing, recreational uses, and development for small acreage housing. The middle section is characterized as urban, suburban, and industrial use with suspected affects on water quality stemming from storm sewers, street and parking lot runoff, wastewater treatment facilities, and housing development. The lower section of Crow Creek from Cheyenne to the Wyoming/Colorado border is represented predominantly by dryland farming, center pivot irrigation, livestock grazing, and small acreage housing development uses. Affects in this area result from storm water carryover, wastewater treatment facilities, livestock grazing, small acreage housing, and irrigation practices.

Crow Creek consists of a diverse cross section of Class 2 perennial streams, municipal-use water reservoirs, and intermittent streams. LCCD has implemented a water quality monitoring program for Crow Creek. The Wyoming DEQ, United States Geological Survey (USGS), and F. E. Warren Air Force Base are all monitoring portions of the stream. LCCD's monitoring efforts revealed that ammonia in the lower reach of Crow Creek has been determined to be coming from the City of Cheyenne Board of Public Utilities (BOPU) Wastewater Treatment Plants and will be addressed when the plants' expansions are completed and online about 2007. Cadmium could no longer be detected and in 2002 was removed from the 303(d) list for Crow Creek. Fecal coliform is still a problem and will be addressed with Best Management Practices (BMPs) installed by landowners and the City of Cheyenne.

Process

The Steering Committee identified concerns and issues and from those developed the following vision and mission statements, goals, objectives and action items for the Crow Creek Watershed:

VISION STATEMENT

Promote actions that lead to a healthy and sustainable watershed.

MISSION STATEMENT OF CROW CREEK WATERSHED

Develop a watershed management plan for Crow Creek that considers water quality, water quantity, property rights, sustainable and diverse wildlife communities, legal requirements, defensible data, planned development, land-use planning, and functions of riparian and flood plain areas.

GOAL #1:
To enhance communication with local, state and federal agencies and the steering committee, agree on objectives, and utilize agency expertise and programs.

GOAL # 2:
Improve the quality and quantity of water in the Crow Creek watershed by identifying the general relationship of flow patterns and fluctuations on water quality and identify water management alternatives.

GOAL # 3:
Define the origin, type, degree and geographic extent of impairments.

GOAL # 4:
Elevate public awareness on the listing of Crow Creek as an impaired water body and the importance of improving water quality.

GOAL # 5:
Develop a watershed plan, which can be successfully implemented to achieve water quality goals and delisting of Crow Creek from the 303(d) list of impaired water bodies.

GOAL #6:
Gain public acceptance and support of the plan by considering the needs and concerns of all stakeholders in the Crow Creek Watershed.

Sampling History

Laramie County Conservation District (LCCD) has been sampling Crow Creek for ammonia, cadmium and fecal coliform since April of 2000. Ammonia was not detected anywhere other than below the two City wastewater treatment plants during the 2001 monitoring season and no samples were collected in 2002. The Crow Creek Steering Committee and LCCD decided to reestablish monitoring for ammonia on a quarterly basis and it is included in the 2003 Sampling Plan.

Cadmium was not detected in the sampling sites. Sampling by other agencies was well below the Standards Maximum Contaminant Level (MCL). In 2002, the combined data was used to remove cadmium from the 303(d) impairment list..

Bacterial sampling will continue during the 2003 season for fecal coliform and *E.coli*. In 2002, it was decided by the Crow Creek Steering Committee and LCCD to introduce *E.coli* monitoring in addition to fecal coliform. This was due to the fact that *E.coli* may prove to be a better indicator of bacterial pollution. The United States EPA and the Wyoming DEQ are in the process of developing standards for *E.coli* that may be in place in 2004.

Fecal coliform exceeded the standards at all sampling sites in Cheyenne. These fecal coliform counts are associated primarily with the storm drains in the City of Cheyenne. The sites below Cheyenne had either trace or low amounts of fecal coliform exceeding the standards occasionally. There were no exceedences for fecal coliform above Cheyenne and below Silver Crown.

The currently established sampling sites for Crow Creek are based on recommendations from the Water Quality Technical Team:

1. Roundtop Road (Above Cheyenne)
2. Martin Luther King, Jr. Park (In Cheyenne)
3. Ames Ave (In Cheyenne)
4. Morrie Ave (In Cheyenne)
5. Above the Crow Creek WWTP (Below Cheyenne)
6. Missile Road 217 (Below Cheyenne)
7. State Section Road 207 (Below Cheyenne)

Findings/Conclusions

Urbanization within the Crow Creek Watershed is progressing and probably provides the greatest impacts to the watershed. Impacts include degradation of water quality, increased runoff to Crow Creek, loss of wildlife habitat, open spaces, agricultural lands, and numerous other impacts. The goals, objectives, and action items identified in the Crow Creek Watershed Plan provide a means to minimize adverse impacts and to promote actions that will benefit the community and the watershed. Community involvement in the implementation of this plan will be the key to maintaining or improving conditions in the Crow Creek Watershed.

Cheyenne's waste water treatment plants are a known source of ammonia. The plants will be upgraded in 2007, which will address ammonia discharge into the stream. If ammonia continues to be detected above accepted levels after the facility upgrades, further efforts will be necessary to find additional ammonia sources. High ammonia levels result in negative impacts on aquatic animal life.

In 2002 cadmium was removed from the 303(d) list as a result of sampling by LCCD and USGS. It is not fully understood what led to the cadmium detection. However, regular monitoring shows that cadmium is not a constant presence and does not warrant additional efforts.

Fecal coliform levels in Crow Creek consistently exceed DEQ standards in the urban area of Cheyenne and near the Wyoming/Colorado border. Urban fecal coliform levels are

most likely the result of storm water runoff. It is unlikely that there is cross contamination with sanitary sewage lines. If sewage lines were a contributing factor, bacteria counts would be much higher than what is currently detected. Fecal coliform is most likely runoff related because the highest peaks occur after storm events. Possible contributors include domestic animal waste, wildlife waste, illegal wastewater discharge from RV tanks and septic systems. At this time, the City of Cheyenne is taking steps to correct fecal coliform impairments through increased street sweeping, improved maintenance of storm drains, and the construction of wetlands and infiltration trenches. They are also conducting a storm drain system analysis to assess the current storm drain system in Cheyenne (Map 2.6). Homeowners can address fecal coliform impairments through proper design, operation and maintenance of septic systems and pet waste disposal.

In the rural area near the Colorado/Wyoming border, fecal coliform levels are also storm related because high peaks occur following storm events. Possible contributors to fecal coliform in this area include septic systems, livestock waste and wildlife waste. To correct these high levels, BMPs (Appendix E) should be implemented to address septic systems and livestock waste. It was also noted that reaches of the stream with healthy riparian areas tended to have lower fecal coliform counts. The riparian area acts as a buffer to keep sediment out of the stream and help filter impurities out of the water.

At this time, the reach of stream in urban Cheyenne is the highest priority for BMPs. The implementation plan places greater focus on this area of Crow Creek because fecal coliform counts are much higher than in rural areas and greater public access to the stream in urban areas poses increased human health risks.

Recommendations

The Crow Creek Steering Committee recommends implementing the action items described in the Crow Creek Watershed Plan. This is by no means a complete list of the actions that will be necessary to solve this problem, but should provide tools and direction to land managers and landowners on the types of projects that can be voluntarily installed to improve the quality of water in Crow Creek. Another key component of the watershed plan is communication throughout the process. Communication between agencies at all levels (local, state and federal) and communication with the stakeholders is integral to the success of the Crow Creek Watershed Plan.